Prof. Steve Keen: Reinventing how Economics is Taught

December 21, 2017

Erik: Joining me now is Professor Steve Keen. Steve, you are very distinguished in the fact that you're one of very, very few people in finance who not only predicted the 2008 financial crisis – but can prove it, because you wrote about the fact that it would happen, why it would happen, and how it would happen, before it happened.

So you do have a book out this year, which is titled *Can We Avoid Another Financial Crisis*. The short answer is no, we cannot. The longer answer, in 140 pages, is a bargain at only $9 for the eBook version of that. We've got a link in our Research Roundup email to the Wiley Publications website where you can order that.

But give us the background. What was the principle cause of the last financial crisis in 2008?

Steve: Fundamentally, that we borrowed too much private debt and became dependent on the rise in that debt as a major source of aggregate demand for both goods and services. And also asset markets. And when that debt stopped rising, that meant total demand actually fell. So it's quite simple in that sense.

A financial crisis is caused by becoming too dependent on credit and credit then ceasing. And when it ceases, because credit is such a large part of demand a huge slab of demand disappears very rapidly. And that, first of all, affects finance markets. Because finance markets, of course, have more volatile prices than goods and services markets. And that collapse in prices means people then stop borrowing money. When they stop borrowing money demand falls and you have a crunch.

Erik: Now, if we take that model – and I could not agree with you more that that's what happened – what you're saying is it is expansion of credit, which, of course, cannot go on forever. So if you were going to fix that problem, presumably you'd have to change the fact that what the economy is dependent on for growth is expansion of credit.

What we've done since the 2008 crisis is for the government to intervene to cause the creation of much more credit. So now we've got more debt than we had previously. And I guess the question I feel that this begs – a lot of us ten years ago said, hey, there's no way that the Fed conjuring liquidity out of thin air can paper over this process. We've got to address the core problem, which is too much debt. And until we address that problem we're not going to see a solution.

Well, guess what? We never addressed the problem. It's ten years later. The sky is not falling. The market has not crashed. I actually had Hugh Hendry, who was one of the most outspoken critics of this when it was happening, say, look, it's time to throw in the towel and admit that Ben Bernanke is a genius. He pulled this off. It worked.

So, if it didn't work, I guess the question is why didn't it work?

And what is it that's going to go wrong? Because we haven't seen the explosion of runaway inflation that some people predicted. That hasn't happened.

What's the problem with the fact that we've just solved the problem of too much debt with more debt? And what could go wrong from here?

Steve: Well, it hasn't been too much debt that solved the problem. First of all, private debt – and I'm looking at American data – private debt in America peaked at 170% of GDP in early 2009. And then, with people paying debt down and people going bankrupt and debt being written off, it fell to a bottom of 145%–146% of GDP in the end of 2014. And it's now risen from that to 149% of GDP.

So we are now at a debt level of more than 20% below where it was in the aftermath of the financial crisis, but slightly above where it bottomed in 2014–2015. On the other hand, government debt has gone from – this is, again, looking at American data – gone from 66% of GDP in mid-2007 up to just over 102% of GDP in 2013. And it stabilized at that level. It's now 99% of GDP at the beginning of 2017.

So that gives you an idea of the increase in debt.

Private debt's actually fallen by 20% of GDP. But at the same time government debt rose by about 40% of GDP. So 20% down, 40% up. Aggregate debt level has risen by about 20%. But that government debt increase substituted government monetary-driven demand for the collapse in credit demand.

So if you look at the scale of government spending as a percentage of GDP, that peaked, I think, at about 10% of GDP in the Obama stimulus period.

Now that, as a percentage of demand, is twice the size of the New Deal. We all know about the New Deal. We all talk about it. A huge government rescue. Tennessee electrification plan, the Hoover Dam, etc., etc. We all know how big that was. But in terms of the percentage of the economy, it was half the scale of what was thrown in under Obama.

So that monetary demand stopped the private sector deleveraging. And led us to about a 20% increase in aggregate debt. That stopped the Main Street collapse. But what Ben Bernanke did had nothing to do with the Main Street story. He did the Wall Street story. And what he did was quantitative easing.

Now, quantitative easing had two ideas behind it, one of which was completely false. And that was the idea that if you put more money into the reserve accounts of private banks they will then lend that money out and create ten times as much additional money in the economy.

And, actually, if you go back and take a look at Obama's speech in 2009, he literally uses that as a reason for the TARP program. He says that – in typical Obama-speak – says that a lot of folks are saying we're rescuing Wall Street. Where is my stimulus? they all say. And he says, the truth is that an extra dollar of money in the banking sector creates as much as ten dollars in the real sector through loans, a multiplier effect that will boost the real economy.

That is economic mathematical bullshit. But what he was told by Hank Paulson and by Geithner – and Bernanke for that matter – all the conventional economists actually believed that banks lend out reserves.

And that's what also led conventional Austrian economists and probably also Hendry to believing that there will be massive inflation, it will all fall over, because of this huge increase in money. It doesn't happen. It simply cannot recur. And I can even quote the Bundesbank to say that's garbage. The Bundesbank quite emphatically says reserves have got nothing to do with lending.

So what you've done is stuff up the reserves of the banks. But of course what that means is – let's talk about the mechanics of it. In the American case, QE was running at about $80 billion per month, which is roughly a trillion per year. That's really massive. Far bigger than the scale of the Obama stimulus.

Actually, let me work it out – the Obama stimulus was about $1.4 trillion. So, actually, it's less than that in scale but maintained for a large number of years.

What happened is – let's work through the mathematics. You create a billion dollars of money by double entry bookkeeping on the Federal Reserve's ledger. You then put that money into the accounts of private banks. And in return they give you mortgage-backed securities and government securities and so on.

So your assets rise and the liabilities (which are the reserves) of the banks rise as well. That means the banks have got a trillion dollars more cash than they had beforehand, but a trillion dollars less of income-earning assets.

And part of the logic of QE which did work is that that meant that the banks were encouraged to go and buy risky assets. For example, shares. So they go and buy shares.

Let's imagine the whole trillion dollars of money created actually boosts aggregate share prices by a trillion dollars. Who holds shares? Wealthy people, pension funds, etc., etc. They have a trillion dollars more money. Let's presume – this is just rough back-of-envelope-type guesses –

that they spend 90% of that buying other assets. And maybe 10% ends up as fees that they pay – higher wages to the impoverished people who work in the finance sector, purchases of goods and services by them. So of that trillion, maybe $100 billion turns up in Main Street.

Now that $100 billion turns over once or twice a year. You get about $100 billion to maybe $200 billion of additional demand in the economy. So you pump in a trillion; your real economy gets $100 billion benefit out of that.

But that's enough to mean you've stimulated the economy a bit. Demand rises again. Fundamentally, you drive asset prices through the roof, as we've seen. You don't stimulate the economy all that much, but enough to attenuate the damage done by two things.

First of all, by the financial crisis. And then by the relatively anemic levels of credit that occurred after that.

So that's what actually happened. And that's, to me, one of the dangers now for the finance sector going forward. Because they're talking about reversing QE. Now if they reverse QE, this whole process also goes into reverse and asset prices could crash.

Erik: And so is that – what I'm looking for is where is the resolution to this? You have asserted, as I understand it, that these actions have not created a viable long-term solution to anything. And you think another financial crisis is inevitable.

Is it the reversal of QE leading to an asset price crash that is the mechanism that's principally where the risk is? Or is there more to it than that?

Steve: We always focus on America, the UK, and most of Europe when we think about the global economy. And they're all countries which had private debt bubbles, like America, and private debt bursts like America had back in 2008. And, in the aftermath, just like America as well, most of those countries have had a reduced level of private debt but still quite extreme.

So I'll give you the UK as an example. UK's private debt went from 55% when Maggie Thatcher was in control to 193% (I think it was) at the peak when Gordon Brown was in control. And it's since fallen to about 170% of GDP.

In effect, if you imagine this being like mountain climbing, American and England and Europe, they've climbed to the peak of Mount Everest. They're now down to base camp and they're trying to climb back up again. They're not going to get very far before they run out of wind.

So those countries I call the "Walking Dead of Debt." But there are other countries that have managed to continue booming by continuing to borrow money. And they're what I call the "Zombies-To-Be."

So, in terms of the "Walking Dead of Debt," that includes America, the UK, Europe, but also,

most interestingly, Japan. Because Japan was the very first zombified economy. And if you look at their history, they always had high levels of private debt. Because, with the keiretsu system, a large part of the investment was financed by compliant banks within one of the big keiretsu systems like Mitsubishi and so on. So they had a high level of private debt finance.

In the 1980s, private companies started to not really borrow money to invest in new technology, they started borrowing to speculate on the stock market, to speculate on commercial real estate. And the household sector got involved in speculating on house prices as well. And you have what Japan literally called the bubble economy in that period.

So if you look at Japan – and Japan always had a high level of private debt because Japanese companies finance their operations not so much by issuing equity as borrowing from banks that were in industrial conglomerates that were called the keiretsus. Like Mitsubishi was a – it was also Mitsubishi Bank.

So in a sense it was debt, but it was debt within a collective level of ownership. So they always had a higher level of debt finance than America had.

If you go back to 1966, the private debt level in Japan was 120% of GDP, which is 140% across the 1970s. But in about 1980, the industrial sector, but also the household sector, started to borrow money to speculate on asset prices. So the private corporations were speculating on shares and commercial real estate. The households were speculating on house prices. And private debt in Japan rose from 140% of GDP in 1980 to 215% in 1990.

So a huge increase in private debt, a huge level of demand. The Japanese actually called that the bubble economy period. It ended precisely on the 31st of December 1991. You then had a slowdown of the rate of growth of debt. It finally peaked at about 220% of GDP in the early 1990s. Since then it's been falling. And it's now stabilized at about 160% of GDP.

With those debt levels it meant that, effectively, Japanese corporations were no longer borrowing money to finance investment. They were simply using whatever returned earnings they had to try to pay their debt levels down. And the Japanese economy became zombified. It hasn't grown – if you remember back in the 1990s we had movies like *The Rising Sun*, expecting Japan to take over the global economy. Well, nobody talks about the rising sun anymore. So that was the very first dead zombie.

Now, by not understanding the economics of that, by focusing upon models where debt and credit don't matter when everything is in equilibrium and where finance is efficient, economists led us to fall into exactly the same trap in countries like America and UK and Europe. So they had a similar crisis at the time of the global financial crisis in 2007-2008.

But there are a number of countries, for example your northern neighbor Canada, that got through the crisis by continuing to borrow money. So they had, at the time the financial crisis hit – so, to give you numbers for Canada – Canada back in 1960 had a private debt level of 80%

of GDP. By 1990 it was 140% of GDP. Its debt level grew much more slowly than America's from then to – when the financial crisis hit, it had much the same private debt level as America, about 170% of GDP (actually slightly above the American level).

But since the global financial crisis it's gone from 170% of GDP to 220% of GDP. Now what that's meant is, because private debt was rising, credit was positive. And that expanded demand in Canada.

And of course you've had as asset price bubble there. We all know about the Canadian house price bubble. People often focus upon the Chinese buying, but, fundamentally, it's driven by private mortgage debt in Canada as well.

They avoided the financial crisis by continuing to borrow money. Now, of course, they've reached their limit. They can't borrow anymore. They've really reached the peak level of debt that they can service. It's starting to fall. And as it falls, there'll be negative credit starting to turn up in Canada. And Canada will have an economic crisis.

And there's many other countries that did the similar type of behavior. Including China of course, the most extreme example. China went from having a private debt level of about 100% of GDP in 2009 to 220% now. That's an enormous – all those ghost cities we know about. It caused an enormous boom and stopped China having a political crisis as people lost their jobs during the global financial crisis.

So the world is now a divided into three groups. The "Walking Dead of Debt" – America's part of that – which has been kept alive by QE.

The "Zombies-To-Be" – which countries managed to avoid the crisis by causing more private debt creation, but they're about to fall over. China being the most obvious. The next biggest is South Korea. Then Canada. Then Australia.

Then you have a whole range of countries like Belgium, Norway, Sweden, possibly Switzerland, Singapore, which will have their own private debt crises. So the "Walking Dead of Debt" don't have another crisis coming. What they do have is continued stagnation. And the only thing which is limiting that stagnation is the QE, which has boosted asset prices far more than it's boosted private demand.

Erik: Steve, I think Japan may have been a special case, because, although they did experience decades of economic stagnation, nothing really blew up in that economy. I think, at least in my opinion, one of the reasons for that is there's so much nationalism and loyalty in that country. When the government tells you it's your patriotic duty to buy Treasuries, you're going to do it. Whether it makes economic sense or not. Other countries don't enjoy that ability to get their populace to buy government bonds that might not make economic sense.

So I wonder, is it just a case of we're turning Japanese and we're going to have economic

stagnation? And that's going to happen across most of the developed countries? Or is there something much more significant in terms of a crisis on the horizon? And how do you see it going down?

Steve: I think bond vigilantes are a fantasy of Paul Krugman's imagination. Actually no, it's a fantasy of people who Paul Krugman criticizes. On this point I actually agree with Krugman. The whole idea that people would cease buying government bonds is just wrong. Because when you have a country which can issue its own money, and that of course excludes members of the Eurozone, there are always going to be buyers for the bonds being issued. Because portfolio managers want to have government bonds as part of their repertoire. And they'll buy and sell bonds.

And they don't make money on the expected rise in the price of bonds, of course, because you're talking pretty much zero interest rates. What they do is they make money on the ups and downs of that. So they need to have the bonds to do open-market operations with the central bank in trade and take advantage of the gains they can make on that front. And they always end up oversubscribing government debt.

Now, in the case of Japan for example, government debt hit 65% of GDP in '87 or thereabouts. It fell until after 1990 and fell to a level of – again I'm just looking this up in my data system here – dropped to 55% of GDP in the middle of 1991. It's risen virtually inexorably since then to 220% of GDP. I think probably the highest level of government debt in the world.

And it's been able to continue financing that for two reasons. – three – I'll take your patriotism one on board. But it's also financial institutions wanting to have government bonds as part of their portfolios. They simply oversubscribe them. And thirdly, if the bonds weren't bought in the aggregate by the financial sector, then the Bank of Japan is an underwriter and buys the bonds anyway.

So the government gets financed no matter what, when it creates its own currency. Now that situation applies to America as well, of course. It applies to the UK. It does not apply to Europe. But it applies to many of the countries who are getting in financial crises right now.

So I think they're going to repeat the Japanese experience. And that is that when there is a collapse in credit but the economists in charge don't actually recognize the cause, in many ways the government automatically goes into a large level of spending versus taxation revenue. So it spends more money than it gets back in tax, it issues bonds to finance that.

It's notional debt level rises. But it can always finance that because it owns its own central bank. So, in that situation, you get additional demand coming in from government spending, sort of offsetting the decline in demand from private credit.

And you end up with a stagnating economy where people aren't investing. They're not borrowing all that much, so the debt levels remain pretty much constant. So you have an

anemic private sector credit demand balanced by a slight level of government demand, and you can remain effectively becalmed as Japan has for 25 years. But you don't have a total breakdown.

Only in countries where you don't have the capacity for the government to issue its own money, like the countries in the Eurozone, do you have a genuine depression.

Erik: So is that what you foresee for countries such as the Eurozone? Because we've, I think, reached the point where this creation of more debt to solve the problem of too much debt – As you say, we've caught back up to where, even though a lot of that private debt was transferred off of the private balance sheet onto the public balance sheet, now private debt is catching up again with where it was.

So how much longer do we have? And what happens? It sounds like you think the biggest problems are likely to be focused in the countries that don't have the ability for the central bank to just print more money.

Steve: They're always going to be the worst. But the countries we're going to see a downturn in are really going to be countries that borrowed their way through the financial crisis. So China dramatically stimulated private lending as their response to the global financial crisis. And if the Chinese Communist Party tells you to lend money, you lend money. No decision about it. Just go out there and anybody with a pulse gets a loan.

In the case of Australia and Canada and so on, there was encouragement by the government for people to take out more mortgages. Australia was quite deliberate about that. And in countries like South Korea it appears that a combination of private sector borrowing, corporate borrowing, and household borrowing has also led to a housing bubble there.

But of course they're now pretty much approaching a repeat for themselves of what America went through back in 2008. So they'll fall over. But, once they've done it, what you have is people will get effectively freaked by the level of debt they've got, carrying a huge amount of private debt, much more than they did in previous crises. And therefore credit demand never gets to be all that high before it goes into reverse again.

And this has been Japan's situation. Every time the private sector started to borrow a bit more money, the government bureaucrats and politicians thought, oh, the economy's recovered. Their response is therefore to reduce the level of government spending. And when they reduce the level of government spending, that takes demand out of the economy as well. The private sector reacts and goes back into deleveraging again, credit demand drops, and the economy falls back into a slump.

And that's why I use the "Walking Dead of Debt" as an expression. You never get enough energy to get any real dynamic going through. The only way to really solve the crisis is to drastically reduce the level of private debt.

And in the case of America I'm talking a private debt level reduction of the order of 100% of GDP. In the UK's case, much the same. Because the UK's level of private debt before Maggie Thatcher started the deregulation, for a century never exceeded 73% of GDP. In the 30 years after Maggie Thatcher came to power, it went from, when she was in control, 55% of GDP to 195% of GDP.

So you've got to really reduce debt back to its historic level in each of those countries. And that's pre-bubble levels. And in the UK's case, literally 100% of GDP reduction in private debt.

Unless that happens, we're all going to be the "Walking Dead of Debt."

Erik: It seems to me that the 2008 event really started in the United States. And housing, of course, was the catalyst that got it going. And then there was credit contagion to other sectors of the credit markets.

What you're describing, though, is not a story of one country. As we had in 2008, having a problem which – of course there was a transmission effect. The United States imports so much from the rest of the world, if the United States sneezes the rest of the world catches a cold.

It seems to me you're describing something much worse than that. You're saying Australia and Canada we know are in housing bubbles, and you think that that private debt situation is about to collapse. China is so important to the global economy and they have had this massive doubling of private debt since 2009. You think that's on the verge of collapse. Europe is in serious trouble.

It sounds to me like you're painting the next crisis – and I don't want to put words in your mouth – as potentially being dramatically worse that what we saw in 2008.

Is that correct? Or am I reaching to say that?

Steve: It's more widespread. And so, as I said, if you want to identify the countries that had the crisis back in 2008, of course America's number one. But you also had the same thing in Spain, in Portugal, in England, in Ireland, and to some extent some of the other European countries.

And when you add up the level of GDP that's involved – and of course America's the biggest slab. It's about 25% of 1/3 of global GDP. So that's why the rest of the world gets pneumonia when America sneezes.

This time round, if you add up the various countries they're an equivalent of about 1/3 of global GDP again. So it's a similar scale to what happened back in 2008. The difference being of course that each of these countries will have their crisis at a different time.

It looks like China's already having a downturn in credit. Canada and Australia are doing it.

South Korea is starting to get there. But other countries like Belgium that I identified, Norway, Sweden – which are all of course very small countries – they haven't yet got to the beginning of falling off the precipice. So it's more distributed over time. It's more distributed geographically.

The most important point, I think, to qualify all that is that China is not your usual capitalist economy. And China's Communist Party, ironically, I think is more responsive to what its people's needs and desires are than any so-called capitalist democracy you could mention. Because when Chinese people riot they really riot. And the potential for political overthrow is sitting there at all times for the Communist Party. So they're responsive to anything which might lead to that level of unrest.

What it means is that, even as the credit bubble is starting to unwind in China, there's enormous government stimulus at the same time. Building all those high speed rails. Frankly, useful infrastructure. Building the Silk Road as part of the export program they're doing.

And I saw recent figures – it's very hard to find any figures that are trustworthy on China – but one of those statistics I saw alleged that the level of government money creation (government spending more than it gets back in taxes) in China is running at 15% of GDP. And that's pretty much 1.5 times the size of the stimulus that Obama did after the crisis had begun in America.

So to some extent, China's negative credit will be attenuated by the positive from government money creation in China. That doesn't apply to Canada. Doesn't apply to South Korea, Australia, Singapore, Belgium, etc., etc. So they will have slumps. And their governments' actions will come in after the event.

So I do see not as serious a downturn as 2008, but I see a crisis in those "Zombies-To-Be" countries that will, to some extent, derail export demand for countries like America. And that will be the contagion effect. But it won't quite be a case of getting pneumonia when China sneezes or Canada sneezes. It'll be you'll get a slight increase in your temperature and a bit of lethargy coming out of the decline in export demand.

Erik: Now, when quantitative easing was announced in 2009, the critics were quick to say, okay, the way that we're going to pay the price for bailing out the economy this way is, eventually, it's going to lead to runaway inflation. Of course almost ten years later that hasn't happened yet.

Some people are starting to say inflation is just around the corner, it's coming. Do you share that view? And do you think that it is just healthy inflation? Or do you think that there is a risk of the quantitative easing that's occurred over the last decade. leading to runaway inflation situation?

Steve: No. It's naïve theories of money that have led people to believe that nonsense, unfortunately. I was always saying it was never going to inflation. That's why my site is called debtdeflation.com. For very good reason.

And that is that mathematical models I have built of the economy and also the logic I'm working from, from Hyman Minsky and Irving Fisher, said that when you have a debt crisis you have deflation not inflation. And that's what, of course, happened.

People don't remember this, but the inflation rate in America fell from +5% to -2% per annum in about six months over the 2008–2009 crisis period. The government stimulus bumped this up to positive inflation once more, but people made the mistake of believing that QE – which massively increased reserves – would lead to a massive increase of lending. And therefore the massive increased lending meant much more money in the economy, and, bang, you'll get inflation.

That is nonsense. That is based on a very naïve theory of money that says that banks multiply up reserves and that the extra money in circulation will therefore cause inflation. Banks do not multiply up reserves.

I've been part of a protest group in economics for 40 or 50 years which has been arguing that the money multiplier model is simply nonsense, the fraction of reserve model is nonsense. What actually happens is banks create money by double entry bookkeeping. And the reserves they have play absolutely no role in that lending.

No, finally, ironically, I think in some ways I'm finding I can actually quote the Bundesbank on that particular front. And the Bundesbank has said reserves play absolutely no role in lending. So the increase in reserves created by QE has had no impact upon inflation in the goods and services market.

But it has quite deliberately had a massive impact upon the financial markets. Because reserves circulate between financial institutions. Because the QE has created such a massive increase in banking reserves, that has meant that banks then go and use those reserves to buy shares. And that share-buying has driven up asset prices. So the inflation that's occurred has not been in the goods and services market. It's been in the asset market.

Erik: Does that lead us to an asset inflation quandary that can only be solved by more and more rounds of QE? In other words, you alluded to the possibility that, with QE shutting down around the world potentially, the process goes into reverse and you start to see a crash in asset markets.

Now, I don't think they would allow that to happen. I think they would bring back more QEs. So does that potentially set up the QE forever, we can't get out of having to do more and more quantitative easing in order to prevent a collapse of asset markets?

Steve: Absolutely. I describe QE as a pact with the devil. In the classic stories of Nostradamus, once you've signed your soul away, you can't buy it back at a later date. So as soon as QE goes into reverse, asset prices will – the process does go into reverse.

So think about what's happening with QE. It's buying bonds off the private sector and putting money into the private sector bank accounts, which they then use to buy assets. If you go the reverse direction and sell bonds back to the private financial institutions, they now get income-earning bonds out of that. But they get a decline in their reserves. And to get the decline in reserves to buy the shares and buy the bonds in the first place they have to sell shares.

So I think asset prices will fall over when Yellen's successor tries to reverse QE. And when that starts to happen – because they've got so caught up in believing that making asset prices recover is a major part of making the economy recover (which, again, I think is false).

But, having got caught in that belief, as soon as the asset prices start to fall over, there'll be panic in the financial institutions, panic in the central bank, and they'll reverse it and go back to QE again.

Erik: Steve, does that set us up for a perpetual loop where we just have to have QE forever? And if so how do we break out of that perpetual cycle?

Steve: I think it does set us up for that. And, again, you look at the history of what's happening in Japan. They've been doing QE for pretty much 20 years as well. So the only way out of this loop – let's go back to basics.

What caused the crisis was too much private debt and too much increase in private debt (which is credit). The solution is to reduce private debt, however you do it. And that's historically been confirmed in research by my philanthropist colleague in the States, Richard Vague, a man who salvaged two of America's major credit card companies. Richard is now a critic of private debt.

He's on a serious analysis of it which you can find in his debt-economics.org website. And his book on the topic as well. And in looking at how countries got out of debt crises around the rest of the world, he said the only way they got out of it was by writing the debt off.

There was no case of a country growing out of a private debt crisis by GDP growing faster than debt unless they had a huge surge in exports, which of course applies to countries like Saudi Arabia when you have a massive revaluation in oil of course. That got them out of their debt crisis back in the 70s.

But, generally speaking, the way out of a debt crisis is to write the debt off.

Now of course we're not even talking about that. I've been pushing a modern debt jubilee for a decade now. But that's not even got into the thinking of mainstream economics. So as long as they ignore the cause, which is too much private debt, and ignore the symptom, which is too little credit demand – you have a name here and what Larry Summers calls secular stagnation is actually credit stagnation.

So long as you have that you'll have the government doing its two forms of support: QE from the central bank and some stimulus spending by the federal government by spending more than it takes back in taxation.

But every time the economy seems to recover, they'll pull out one of their two supports and try to get back to a balanced budget again. Or they'll try to end QE and the system will fall over again and bang, wash, and repeat.

So, so long as they ignore the real cause we're going to continue with the real problems.

Erik: I want to move on to another topic, which is the US dollar. We have a special coming up over the next few weeks. We're talking to several experts who think that the US dollar will lose its reserve currency status for a number of reasons that our listeners will get into in those episodes.

But I think you have a view that reserve currency status has been a curse from the beginning. So please elaborate. What's your view on the dollar's reserve currency status? And why is it perhaps not that bad of a thing if it were to be lost?

Steve: It's one of those things that Donald Trump would call a bad deal, because you get sucked into something that looks like a good deal. And of course the good deal that Americans thought they got at Bretton Woods was that we're the biggest gorilla on the global stage now. This silly bloke in England, Keynes, wants to bring in his international currency called the bancor which would be created by the International Monetary Fund.

No, we're going to get the dollar as reserve currency. We're going to be the biggest currency on the planet. Look at us. Aren't we the big bully on the beach taking over from the English?

The trouble is, if you do that, then people who have to get involved in foreign trade actually need American dollars. It's not because they are buying or selling any goods and services to you. They need American dollars to do the trade themselves.

That gives those other countries a demand for American dollars independent of what's happening with American exports or imports. Which means the American currency gets to be overvalued compared to what it would be if it wasn't the reserve currency. And consequently American goods are more expensive than they would be if you weren't the reserve currency.

So a large part of the de-industrialization of the States that has occurred in the last 30-40 years I would source back to the American currency being overvalued because it's the reserve currency. And if you got rid of the reserve currency status, you'd actually have a chance to revive American manufacturing.

Erik: Would that not also at the same time, though, lead to a loss of – I don't know if enjoyed

is the right word – we've gotten away with politicians believing that deficit spending – deficits don't matter. And I don't think it's really the case that deficits don't matter. It's that you can get away with deficit spending when you're the reserve currency and there's such a strong international demand for dollars.

If that international demand for dollars goes away, doesn't that mean that suddenly deficits matter again and the US would have to spend within its means?

Steve: No. This is a total fallacy, I'm sorry, Erik, but it's a total fallacy. And that's one reason I sent that paper to you to discuss with your readers. I go through an incredibly simple set of models for the UK parliament for an inquiry they're doing into household finances where I say, what happens if a sector in the economy tries to save money?

And what I show in that paper is that, if you have an individual sector saving money, that's great for the individual sector. But there's no money creation going on. Any additional money it accumulates in its bank accounts has to be balanced by precisely as much a fall of money in the bank accounts of the other sectors in the economy.

And, in fact, by spending less you actually have less expenditure. Expenditure is one of the three ways we measure GDP. If your expenditure falls, aggregate GDP falls. So the attempt by a single sector to save money actually causes a fall in GDP. That's stage one.

And then I make the point that if you're going to have everybody saving money – and of course people do – individuals and sectors and corporations all do want to save money, they want to accumulate money over time. The only way we can all do that is if there's some other sector that actually dis-accumulates. Somehow, it dis-saves all the time.

One option for that is the banks of course. Banks don't save because banks don't have an account out of which they lend money which they can run out of. They create money by double entry bookkeeping. So their assets go up, their liabilities go up. And that's how they create money.

And if they do that, if banks are creating more with new loans than they're getting back in repayments, they can therefore increase the amount of money in all the privately run financial sector bank accounts.

But of course that comes with an absolutely identical increase in the debt of those sectors. So there's no new money creation coming out of that. And over time, if you go down that path too far, you actually have the private non-bank sector getting into negative equity.

So the third situation I look at is where you have government money creation, meaning that governments spend more than they get back in taxation. Governments can do that because they own their own banks. You and I can't pay our debt with the Bank of Steve or the Bank of Erik. The American government – and Donald Trump actually was quite cognizant of this some

years ago – they American government creates money. And it has a central bank which is obligated to finance government spending.

So as long as you have the capacity to create your own money, which America has, and you have the capacity to finance that with a central bank, which you also have, there is no problem in funding a deficit.

Deficit is the wrong way to think about it. It's an excess of government injections into the economy over government withdrawals from the economy. And the gap is financed, ultimately, by the central bank creating that money. And nobody rejects – if the government deposits $1,000 in your account, you don't send it back because it's false money. You've got $1,000 you can spend.

So any government that has its own currency, that has its own central bank, and – this is important – that is not running a major trade deficit, can get away with it indefinitely. The breakdown is when you have a trade deficit as well.

Now, what being the reserve currency has meant for America is they can run a trade deficit and not worry about it. Because if you run out of American dollars, and you need American dollars for international trade, you can create them.

Now, in the other case, if countries like, for example, Argentina run out of American dollars, they've got to borrow American dollars. And therefore the trade deficit ultimately brings to a stop any creation of domestic money by the Argentinian central bank.

So it isn't the case that reserve status means that you can get away with government deficits and after the reserve status goes you can't get away with deficits. It means you've got away with deficits and a trade deficit at the same time.

If you lost reserve currency status, you could still have government money creation. But the limit would now be whether you're running a trade deficit or not. And of course America is running a trade deficit.

Erik: And all of these ideas that you've just given a very high-level overview of are spelled out in much more detail in a paper that we have a link to in our listeners' Research Roundup email. If you're not yet registered you can just go to the website macrovoices.com, look for the download instructions above Steve's picture on the website.

And that paper is titled "Submission to UK Parliamentary Treasury Committee on Household Finances: income, saving, debt, asset markets, and the current account."

Steve, I want to go a little deeper. I think our listeners can read that paper on their own. But one of the things that you do in that paper is you refer to models that you've developed in a software system of your own design and creation called Minsky. Give us the background.

Where did Minsky come from? Why did you develop it? How do you use it in your teaching of economics?

Steve: Back when I did my PhD – I've been a critic of mainstream economics since 1972, so 45 years of criticizing the mainstream. And as part of that I did courses in nonlinear differential equations and complex systems and chaos theory in mathematics courses.

And I became aware of a range of software called system dynamics which has two branches. It began with the work of a Jay Forrester in MIT back in the '50s and '60s. And then led into one branch which is used in management – like Vensim, Stella, iThink, and so on. And another branch in engineering -- packages like Simulink, VisSim, and other programs of that class.

And they build dynamic models of a system using differential equations. And the differential equations are designed using flow charts.

So I saw that as a useful way of illustrating my models. One of the dilemmas of those programming platforms is if you want to try to cable up financial flows using wiring you get an absolute mess. These models themselves – people who create them often refer to the diagrams as spaghetti diagrams because there are cables going everywhere.

And it was even worse when you tried to model financial dynamics, because every financial transaction should be properly recorded in the system. It has to be recorded four times.

And I realized over the last ten years or so that the ultimate GUI (graphical user interface) for understanding financial flows was invented by accountants back in the 15th century – the double entry bookkeeping table. And none of these systems had that sort of system built in.

So I developed Minsky as a way of piggybacking on the whole concept of system dynamics for dynamic modeling. But adding in the capacity to build models of the financial sector using double entry bookkeeping tables.

And that has been massively important to me over time, as a way of me intellectually learning about money creation, but also as a teaching tool and now actually as a research tool. Because, once you define the financial flows that exist in an economy, and you link that to real sector activity as well, you can build a non-equilibrium monetary model of an economic system.

And, in fact, I've got a student in Portugal who's built the most elaborate monetary model of Portugal which is more accurate. His Master's student model is more accurate than any of the official models held by the Treasury or the central bank of Portugal.

So it's been a marvelous process for me. But this entire software package so far, the total funding for it, has been about $300,000 US. Which is trivial. So I've only really scraped the surface of what I can do with Minsky.

But it is a classic way of being able to set up a monetary non-equilibrium model of an economy and seeing how it behaves. And that's what I do in that particular paper, is use several extremely simple Minsky models to make the logical point that if you want to have everybody saving money the government has to spend more than they get back in taxes.

Erik: And this is part of why I wanted to save you, Steve, for our last regular-format show of the 2017 season. Because we have got an overwhelming number of downloads for our listeners.

First, there's the paper that you just described which uses a Minsky model to make many of its points. Start there and I think you'll be impressed with these diagrams, folks. They were all generated from the Minsky software.

How much does it cost to buy the Minsky software? Totally free. The download link is in your Research Roundup email.

Once you've installed the Minsky software on your computer, would you like to run and see a live animation of these models that Steve is referring to in this paper? The Minsky File, is the model that you can load into the Minsky software, click the Play button, and it animates. In real time it goes through and shows these capital flows moving from households and so forth.

There's a download link for that in your Research Round email as well.

And there's a link to a video which is basically Steve demonstrating the use of the Minsky software. It's the same model that you see in this paper. And he describes how various parameters can be changed in the Minsky software in real time while it's running. You can see the capital flows and how they change GDP and so forth. It's a really fantastic tool and I think you're going to find it to be very interesting.

Finally, there's one more download in this week's Research Roundup email from you, Steve. Which is another paper that you wrote called "Energy Aware Theory of Production." Please tell us what that one is about.

Steve: Economic theory has ignored the role of energy as a factor of production right since Adam Smith. And this, to me, has led to enormous fallacies in economics because it actually – Economic theory – I'm not just talking neoclassical, I'm talking Marxist theory as well, and to some extent post-Keynesian theory, certainly Austrian theory – their theories of production assume we can product output with no energy.

Now that's nonsense. You can produce nothing without energy. And, in fact, what we produce is really mining the energy and turning a fraction of it into goods and services while the rest is waste energy which we call entropy. So we need to have a model of production which gives energy an essential role.

And I argue firstly in the paper, the only school of economics to ever have done that is the physiocrat school that was based in France and goes back to the work of people like Richard Cantillon and François Quesnay, because they talked about land being the source of all value.

And, given what they knew at the time, and the fact that France was predominately an agricultural country, that was quite accurate. So we shouldn't have started with Adam Smith. We should have started with Richard Cantillon and François Quesnay as the true fathers of economics.

And what I do in the paper is show the way to include energy in an essential sense is to realize that labor and capital without energy simply don't make sense. A little insight that led me to the mathematical model I develop in that paper is the thought that labor without energy is a corpse, and capital without energy is a sculpture.

So, therefore, labor and capital can be seen as means to harness the free energy we find in the universe, whether that's by absorbing sunlight in agriculture, or mining up oil and fossilized plants we call coal, which is fossilized solar energy, and burning it.

So there are ways to harness it. Labor and capital both use energy. And when you work through the mathematics, I finally find that the vast majority of the physical output we produce on the planet today is produced by the energy we mine, using our machines. And labor, basically, presses the buttons to operate the machines. But, fundamentally, that's what produces value in the economy.

I then showed that that's actually a more accurate model than the neoclassical Cobb–Douglas production function model. And therefore completely inverts our whole understanding of social dynamics as well. Because part of the old Marxist criticism was capitalists are exploiting workers. The neoclassical response was, well, they're both being paid their marginal product.

I'm saying both of those are wrong. What actually is happening is that labor and capital together in the production system are exploiting energy. And they then fight over the proceeds. It's a realistic model of production.

It necessarily links economics to the ecology, because to exploit energy you must generate waste energy. So all the naïvety of economists about global warming would not have occurred if they'd understood the role of energy properly.

And it also implies that there is a potential future where, as we produce more and more machines that are actually intelligently managed – and we have AI managing them as well – more and more of output is going to be produced without labor.

So we have to prepare ourselves for a world in which labor can't get a share of the production we have on the planet through bargaining or, effectively, blackmailing the capitalists and saying

if you don't pay a decent wage we won't operate the machines. It's getting to the stage where that won't matter. So we have to change our social distribution of income as well and consider things like a basic income.

Erik: And, again, the link to that paper is also in your Research Roundup email. Or if you are not registered yet just go to macrovoices.com and look for the download instructions above Steve's picture on the home page.

Steve, I'd like to shift gears now to a topic which I think is absolutely fascinating, which is the journey that you've been on. You're a pretty famous guy. You predicted the financial crisis and you wrote about it before it happened, describing why it was going to happen, what was going to happen, how it was going to happen, and you nailed it.

Now, a lot of people would assume, if you're a professor and you've got that kind of track record, you must be teaching at some Ivy League university. Harvard or Princeton or something. That's not true. An irony that you have described in your previous interviews on this program is that if you are a strong critic, as you have been for decades, of the neoclassical system of economics – which is so passionately embraced by the Ivy Leaguers – you can't teach at the Ivy League schools. You almost, if you want to teach how the economy really works, you have to do it at a B-rate university because they won't have you in the Ivy League.

What's happened, I think – correct me if I'm paraphrasing this incorrectly – even that path, with changes that have occurred in the university system, has led you to a point where you're ready to walk away from the university system. Which I salute you for. I am a huge fan of education, but I think the university system is very broken.

And you're kind of forging, I think, pioneering your own path of teaching economics over the internet to people who want to learn how the economy really works. It's not a degree program, you don't get a university degree for it. But it's something that anybody can participate in.

So I'm very curious. How is this going for you? Who are the students? Because I would think that university-aged – people in their late teens, early 20s – they care about getting a degree, which you can't offer them separately.

Who are the students of this? How's it going? Is it catching on? Is it working for you? And where can people who are interested in finding out more about it learn more about what you're doing?

Steve: Okay, it hasn't quite got to the stage of me running an educational system, though I'm using the Patreon website. And you might have seen a bit of controversy about Patreon recently when they tried to change their fee structure, which creators like me didn't like. But Patreon is a continuous time version of Kickstarter or Indiegogo. So, rather than getting funding from the public as a venture capitalist thing, effectively, where you get some products back for a product launch, with Patreon you sign up to support an artist that you like. And you sign up

either to support as little as $1 a month or $1 per creation by the creator.

Most of the people there are graphic artists, comedians, people running podcasts, yada yada yada. I heard about it last year and I thought, well, I can't get any research funding to develop Minsky, I've done all that research funding either through iNet, SourceFunding, Institute of Economic Thinking.

Back in 2010, I ran a Kickstarter campaign when I got shafted from the University of Western Sydney. And then when I learned about Patreon I thought, well, I can get continuous money to fund my software program for Dr. Russell Standish to continue developing Minsky. I'll set up a Patreon page.

And then the government change you were talking about occurred in the UK. They deregulated controls over a number of positions the different universities could offer for intake into courses in humanities and so on. And the top-ranked universities basically wide-ended the student numbers for universities like Kingston, which are down at the bottom of the pecking order. Student numbers disappeared, and I found I was going to be asked to teach four times as much to my students – four times as much teaching – and I'll lose the capacity to do the public talking that I do.

So rather than suffering from that, I decided to use Patreon to fund my own salary, become an independent intellectual. And it's currently raising precisely $5,331 a month from 756 patrons. And overwhelmingly they're mature aged people and quite predominately engineers who want to see me revolutionize economics.

Erik: Steve, I know that for your Patreon supporters you actually publish a special – it's indirectly a subscription podcast – where you are teaching a lot of economic content. Anyone who supports you on Patreon for at least $10 a month is eligible to participate in that. The thing that occurs to me, though, there's an old joke that real changes in economics only come after somebody writes a book that starts with the word "Principles of..." It seems like there is a lot of precedent for that.

You've got so many really concise theories and concepts here that I think really give neoclassical economics a run for its money. When do you write your book that starts with "Principles of..." in its title so that it can redefine the landscape and maybe lead to something that is a major change in the way we think about things?

Steve: Funnily enough, I actually started writing that book, with that title, when I was in Edenborough at the Institute for New Economic Thinking conference, which was pretty ordinary. And the young students' initiative Festival of Economics, which is actually extremely good.

And there I am in the home town, so to speak, of Adam Smith and I realized that I had the starting line for writing my principles of political economy. And, firstly, why I call it the

"principles of political economy" rather than "principles of economics" is that you have to include the distribution of income in your thinking. Economics that leaves that out is nonsense economics and, therefore, you inherently have to be political in that sense. So let's acknowledge it.

So, back to *Principles of Political Economy*, which is the title of John Stuart Mill's book, or *Principles of Political Economy and Taxation*, which was Ricardo's. But the reason for thinking about the opening line in Edenborough is I actually think of Adam Smith not as the father of economics but the person who led economics astray.

Because the physiocrat school – and he met major members of the physiocrat school in France before he wrote *A Wealth of Nations* – they argued that all wealth and all production comes effectively from energy. They said land, but really it says energy when you put it in modern terms. Because the word energy apparently wasn't even invented until 1808, long after the physiocrats ceased existing.

But they said all wealth comes from land, which is really saying it all comes from energy, and then we have the distribution of wealth coming on top of that. And Smith says all wealth comes from labor.

That led to the interminable labor theory of value fights inside the classical school, that led to the neoclassicals coming out with their nonsense theory where labor and capital get their marginal product – so I want to take it right back to the physiocrats.

So my opening line of the book was to say economics went astray from the very first sentence of Adam Smith's *Wealth of Nations*. And I go back and say we should actually use the very first sentence of Richard Cantillon – and I've forgotten his name – but *Studies in Economics*. And that is where we should start with energy playing an essential role. And then I go forward from there.

So I hope – it's going to take me years to write the book because, as well as having a large amount of history of economic thought, I've got to also explain thermodynamics without drowning people in technical argument. And I've got to explain money creation. I have to explain non-linear dynamics, complex systems, and so on. So it's going to be a large work. But I hope I'll be – I'm setting myself a target of finishing it before I hit 70. And that's five years away.

Erik: And, for people who can't wait until the book is done, there's plenty of opportunity to support you on Patreon, listen to the podcast, receive your writings and other papers, and learn and participate in the process that you're going through along the way.

What's the best way for people who want to get involved and follow your work to do so? Is it your page at Patreon?

Steve: Yes, absolutely. It's https://www.patreon.com/ProfSteveKeen. And go there and sign

up. I want people to sign up with an amount of money they don't notice. I don't want people to sign up and give me money that their wife or spouse talks about over breakfast. So if you felt uncomfortable giving $10, then give $3. If you feel uncomfortable giving $3, give $1. People do it as a no-brainer and then they get the access to all my work for $1 a month up. Podcast starts at $10. I start giving away signed copies of books beyond that level. But what you're comfortable with.

It's really quite an interesting community. I'm learning a lot from the subscribers. I've got a lot of good engineers inside there in particular. Some people with a good knowledge of biology. Others who are in banking. So there's an interesting debate going on there. The Patreon website's reasonable about it.

It doesn't give as much control as I'd like for discussions, but it's a good spot, it's a good conversation. And, as you say, as I write drafts of the book and I write various other research papers, they go up there. And I then get extremely valuable feedback from my patrons. So it's a good community. I'm quite pleased about it.

And it's providing enough for me to – I can't go and party every night, but I can certainly pay the bills and continue being an intellectual independent of all the bureaucratic and political controls that are hobbling universities these days.

Erik: And supporting Professor Steve Keen as a pioneer in reshaping economics still costs less than smoking cigarettes or a daily cup of coffee. At patreon.com. We have a link to that Patreon page in your Research Roundup email.

We're going to have to leave it there in the interest of time. Steve, thank you so much for a fantastic last regular show format of the season. We couldn't have ended it on a better note. Patrick Ceresna and I will be back as MacroVoices continues. Stay tuned, folks, we're going to tell you what to expect from our year-end special.